



Webinar Efficiency-as-a-Service (EaaS) Energy efficient food and process industries through servitisation



16 March 2022, 13:00 - 14:00 CET



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InnoEnergy



Co-funded by the
European Union



Webinar Efficiency-as-a-Service (EaaS): Energy efficient food and process industries through servitisation



Panelists

- Walter R. Stahel
- Ilmir Gareev
- Dimitris Karamitsos
- Arno Nijrolder



Webinar Efficiency-as-a-Service (EaaS): Energy efficient food and process industries through servitisation



Agenda

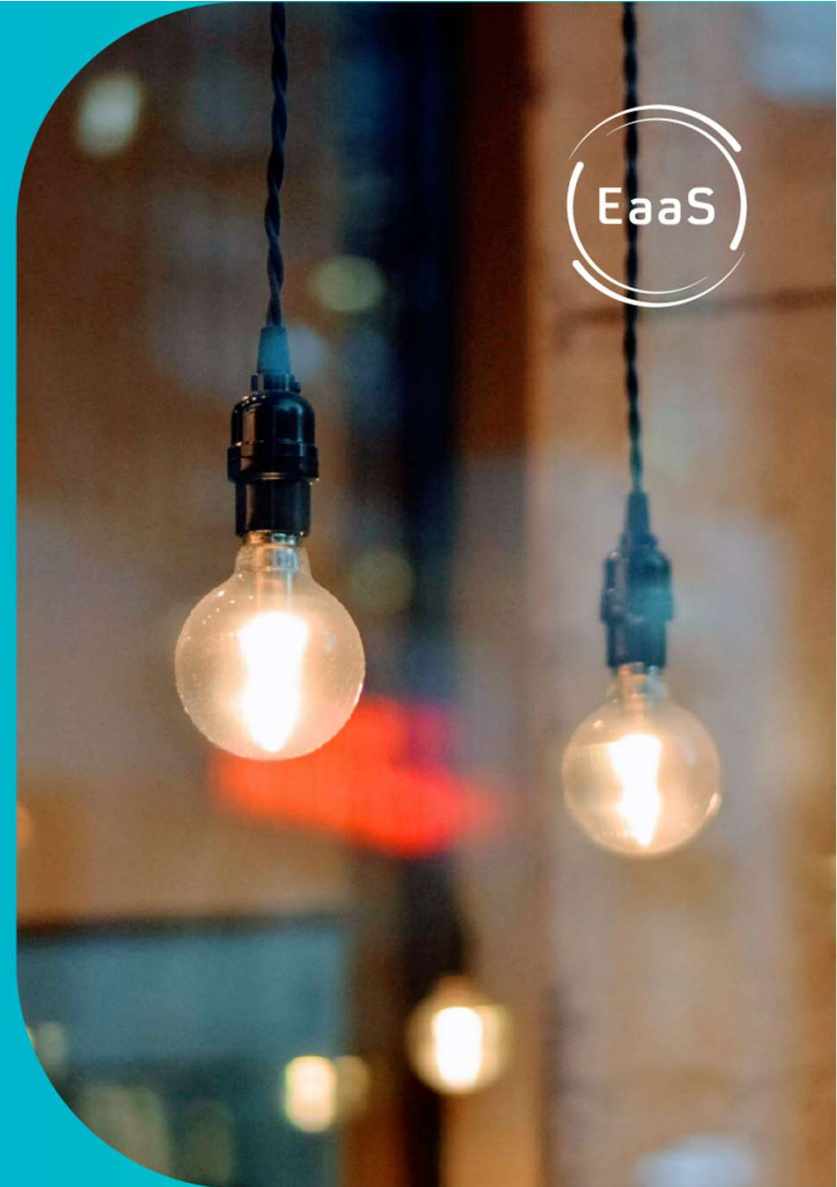
- Circular and Performance economies
- Q&A
- Servitisation in practice: AIRPlan
- Q&A
- Conclusion

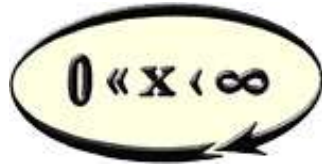


Webinar Efficiency-as-a-Service (EaaS): Energy efficient food and process industries through servitisation

Session 1

Circular and Performance Economies





Efficiency as a service – Circular and Performance Economy

Servitisation seminar, Amsterdam, 16.03.2022

Dr h.c.mult. Walter R. Stahel

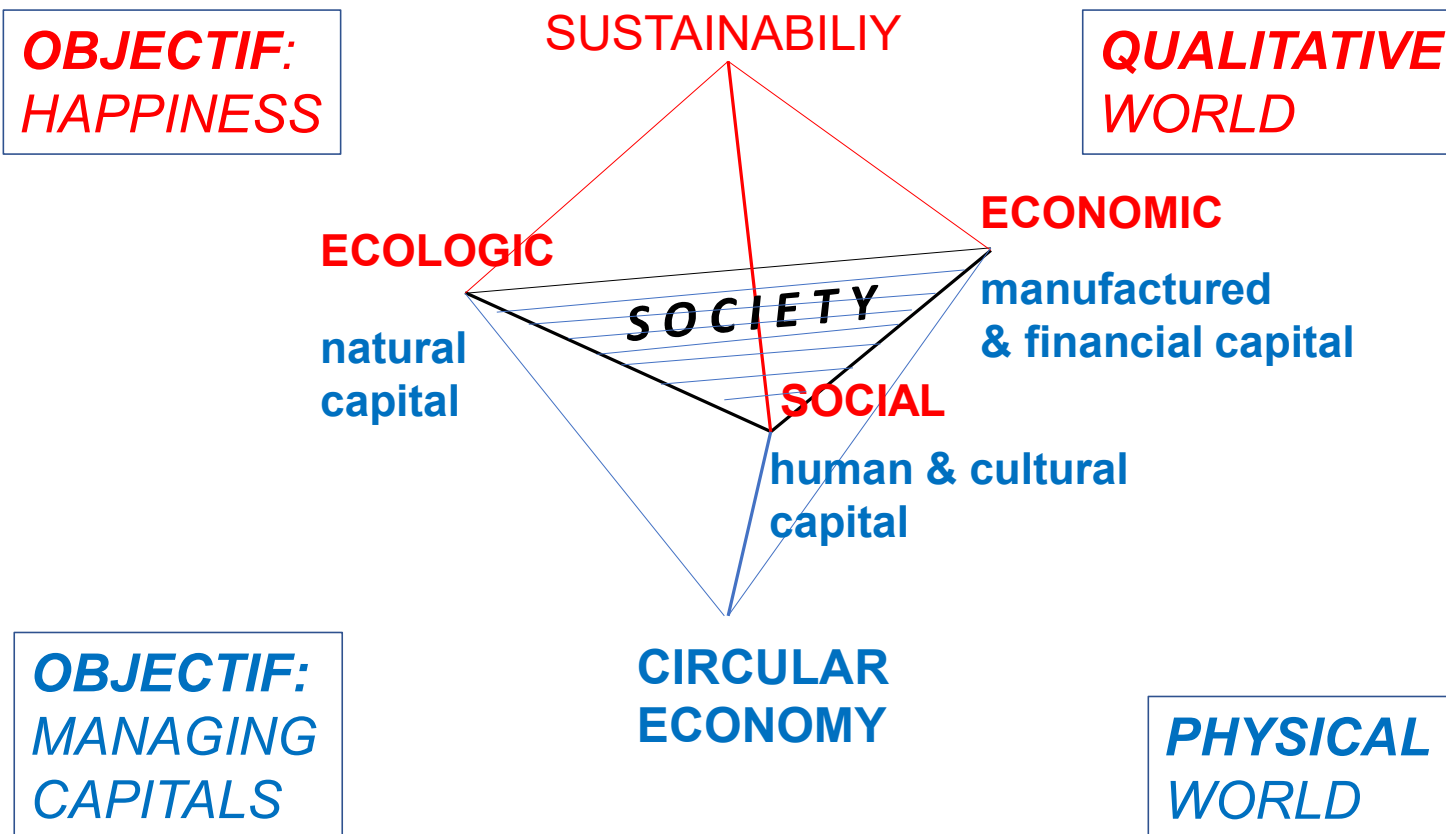
Full Member of the Club of Rome,

Visiting Professor, Fac of Engineering, University of Surrey

Senior Research Fellow at CERC of Pontois Business School

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Sustainability – the opposite of war



*Sustainability comes from **caring** for natural, human and manufactured assets.*

The origins of circularity: Nature,
infrastructure – functional design for long-term use,
good husbandry in societies of poverty, scarcity:



***use it up,
wear it out,
make it do
or do without***

Nature, circularity by evolution:

water, people, wood, wool, leather, food, stones, minerals, .

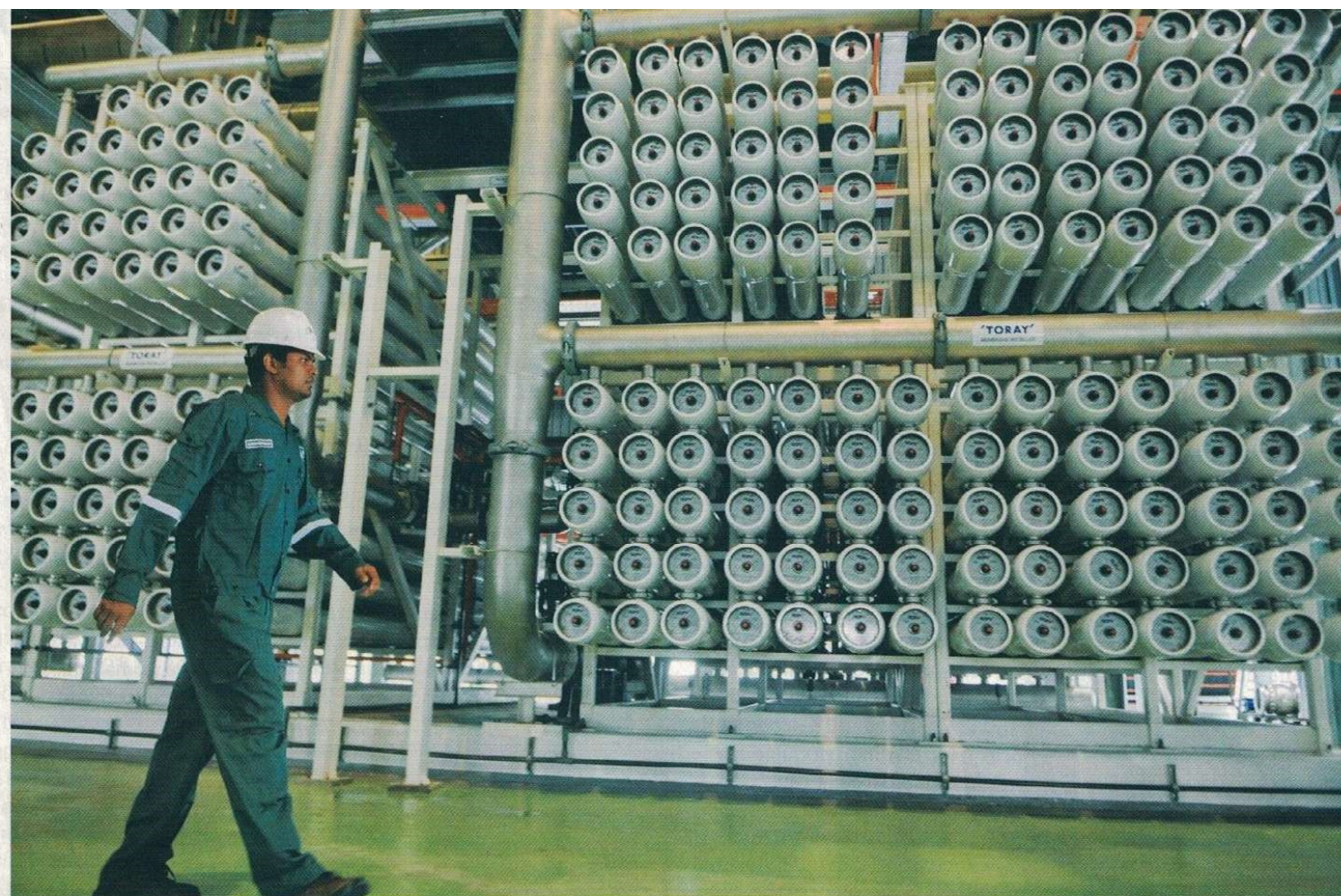
The Circular Economy is about essential services to preserve stocks – quantity and quality – of:

- **natural** capital (e.g. **water**),
- **human** capital (**labour**, skills, expertise, wisdom),
- **cultural** capital (monuments, landscapes, arts & crafts),
- **financial** capital (investments, wealth),
- **manufactured capital** (materials, objects)
- and **immaterial** assets (embodied water and CO₂; liability).

Note: the industrial economy is about managing resource flows to create value added through productive work!

There are two special renewable resources:
water and **labour** (skills, expertise, wisdom)

- **Water:** quantitatively because there is no other resource that can replace it, and qualitatively because clean water is a necessity for the health and survival of people and animals.
- **Labour:** people are a renewable resource and the only resource with a qualitative edge that can be greatly improved through education and training - rapidly degrading if unused.



NEWater
Singapore
process
innovation to
convert waste
water into drinking
water, and
recovering non-
renewable natural
resources,
e.g. phosphorous,
from waste water
streams.

ROSALAN RAHMAN/AFP/GETTY

One of five water-reuse plants in Singapore, which together supply about 40% of the nation's water for drinking and other uses.

Drink more recycled wastewater

13 Jan 2021

Stahel RWTH Aachen CE & Circular Sciences

Source: NATURE

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Take-aways – Nature and people

- **Sustainability comes from people caring** for natural, cultural, human assets and belongings.
- There is no waste in Nature, spent natural materials are food for other organisms, **i.e. all waste is man-made.**
- most products from Nature are perishable (eg food) and can benefit from a cooperation with the industrial world
- **Industrial waste can now be re-defined as manufactured objects without a positive value and without an ultimate liable owner.**

At the intersection of nature and industry

Two examples

- selling the use of equipment temporarily - systems innovation as a service to farmers
- exploiting nature's regenerating capacity instead of industrial processes



Tata Steel - yes we can
has developed a mobile
'canning line concept', which
enables farmers to can their
produce on-site.

this diminishes food waste
at the source (no over-/
under sized fruit) and
enables farmers to
harvest ripe tomatoes
achieving higher price

5 Aprile 2019



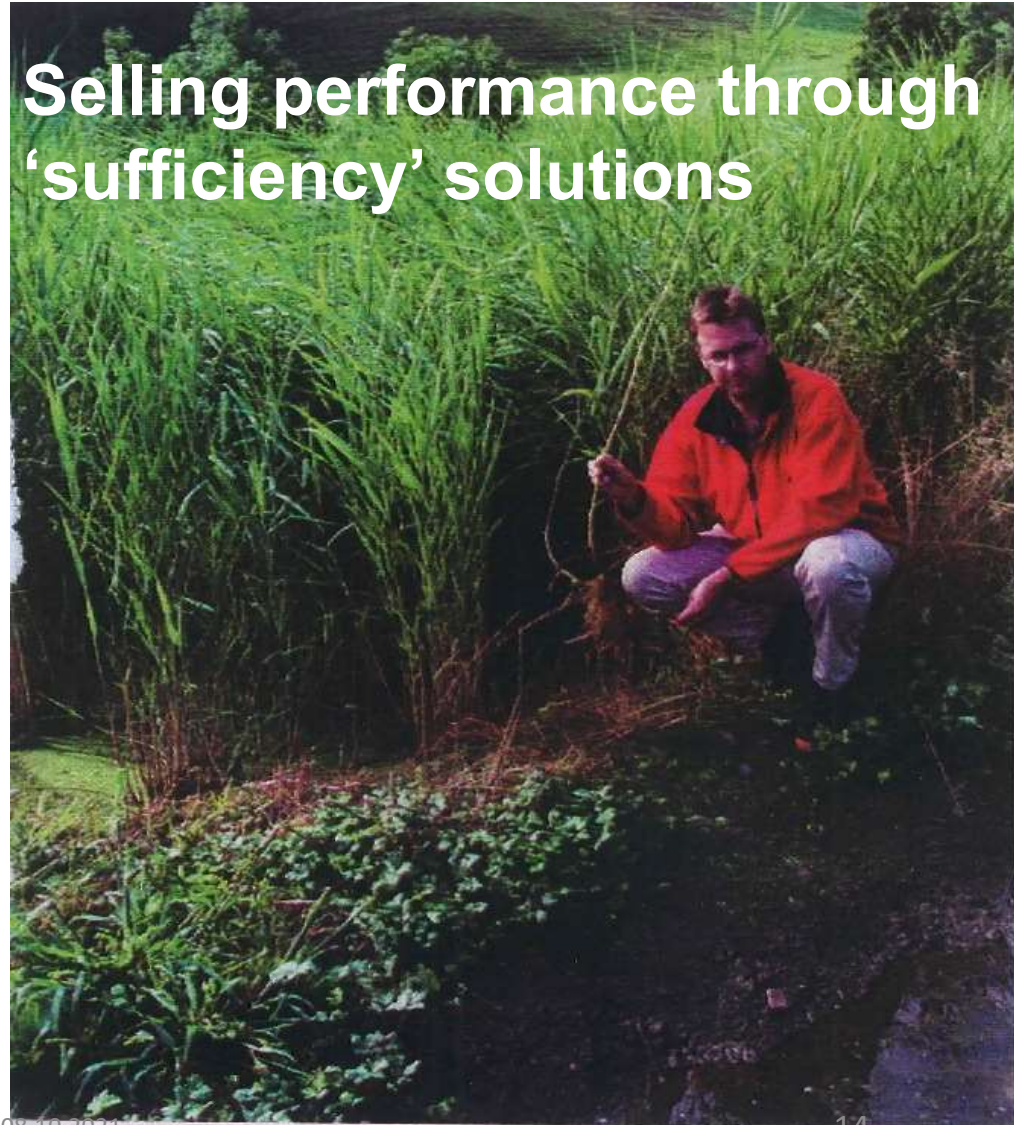
Strategies differ between regions

For rural areas,
'organic' waste water
treatment plants are low-cost
(no 'bricks' or pumps), create
biotopes and flood basins,
have no sludge (waste) issue
– but need space
(4 m²/habitant).

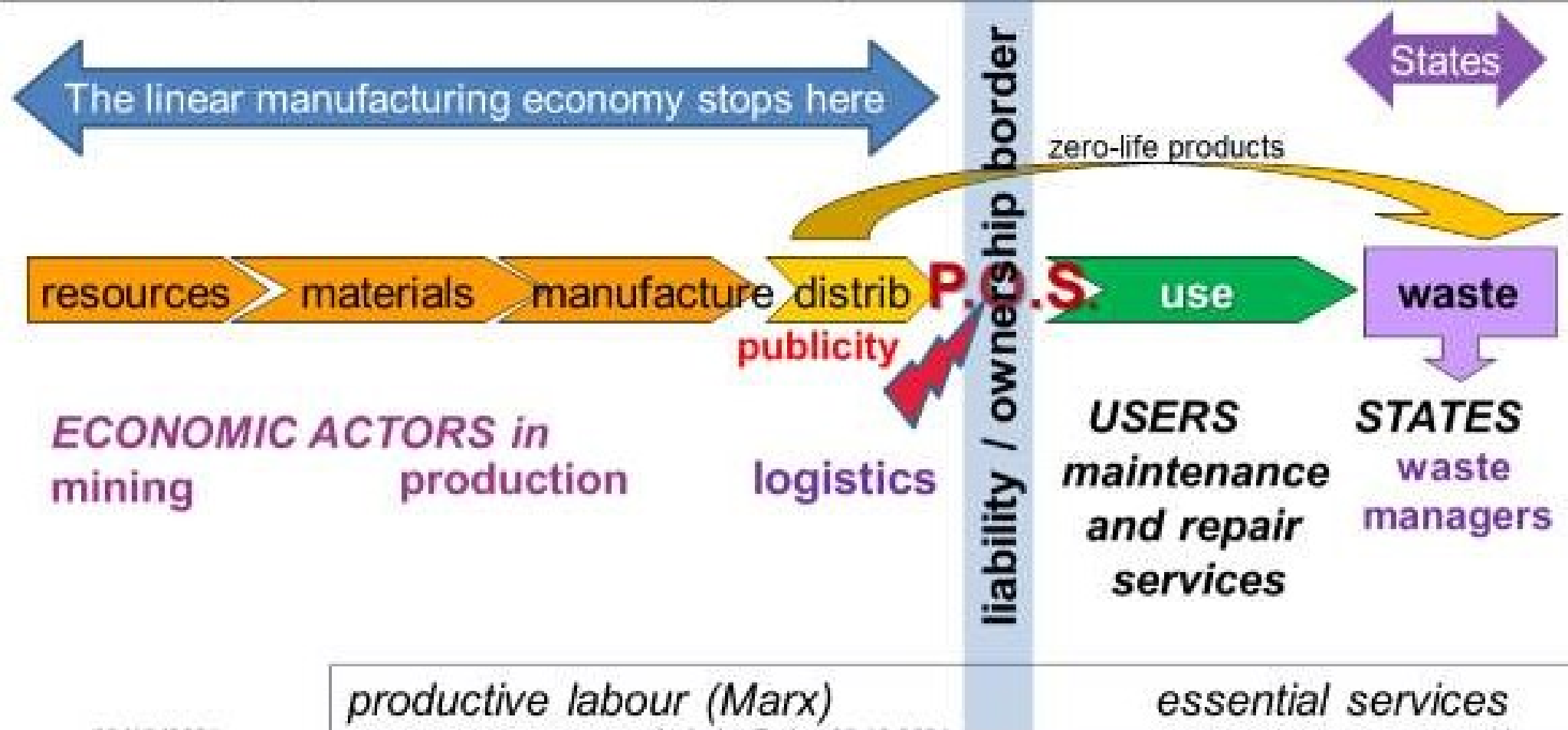
08/10/2021

Stahel at Torino 08.10.2021

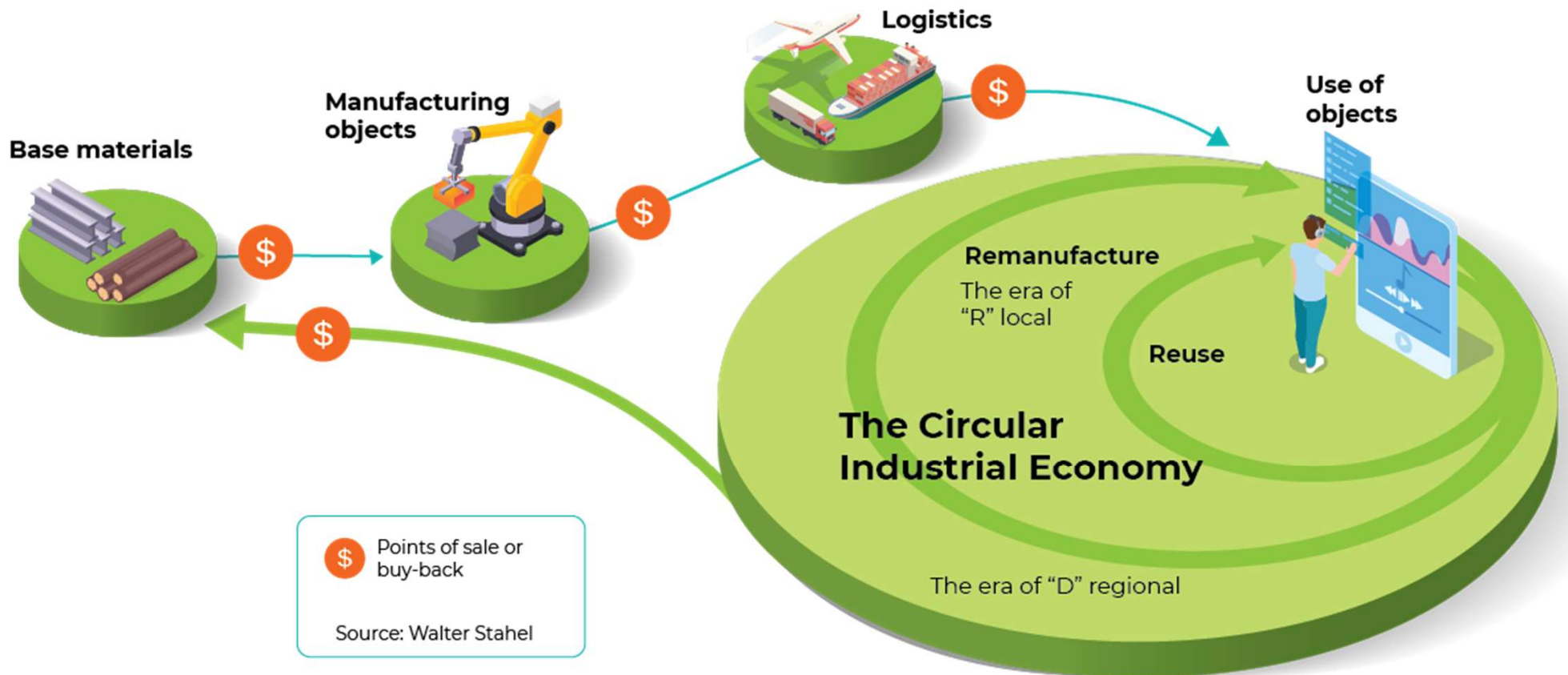
Selling performance through
'sufficiency' solutions



REMINDER: the linear industrial economy's producer liability stops here



The circular industrial economy



The Circular Economy
is omnipresent, “silent and invisible”.
The proof ?

**How often do YOU buy or sell
used goods ?**

The drivers of the Circular Economy of objects:
use value of **objects** and **trust**,



Probably the most reused objects world-wide

**bank notes:
dirty,
contaminated
with bacteria
and drugs,
old design**

**but
guaranteed**
by National
Banks or CEB

In the era of 'R'
owner-users are
in control
of their
belongings

Who takes
decisions?

08/10/2021



Stahel at Torino 08.10.2021

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The inertia principles of the era of 'R'

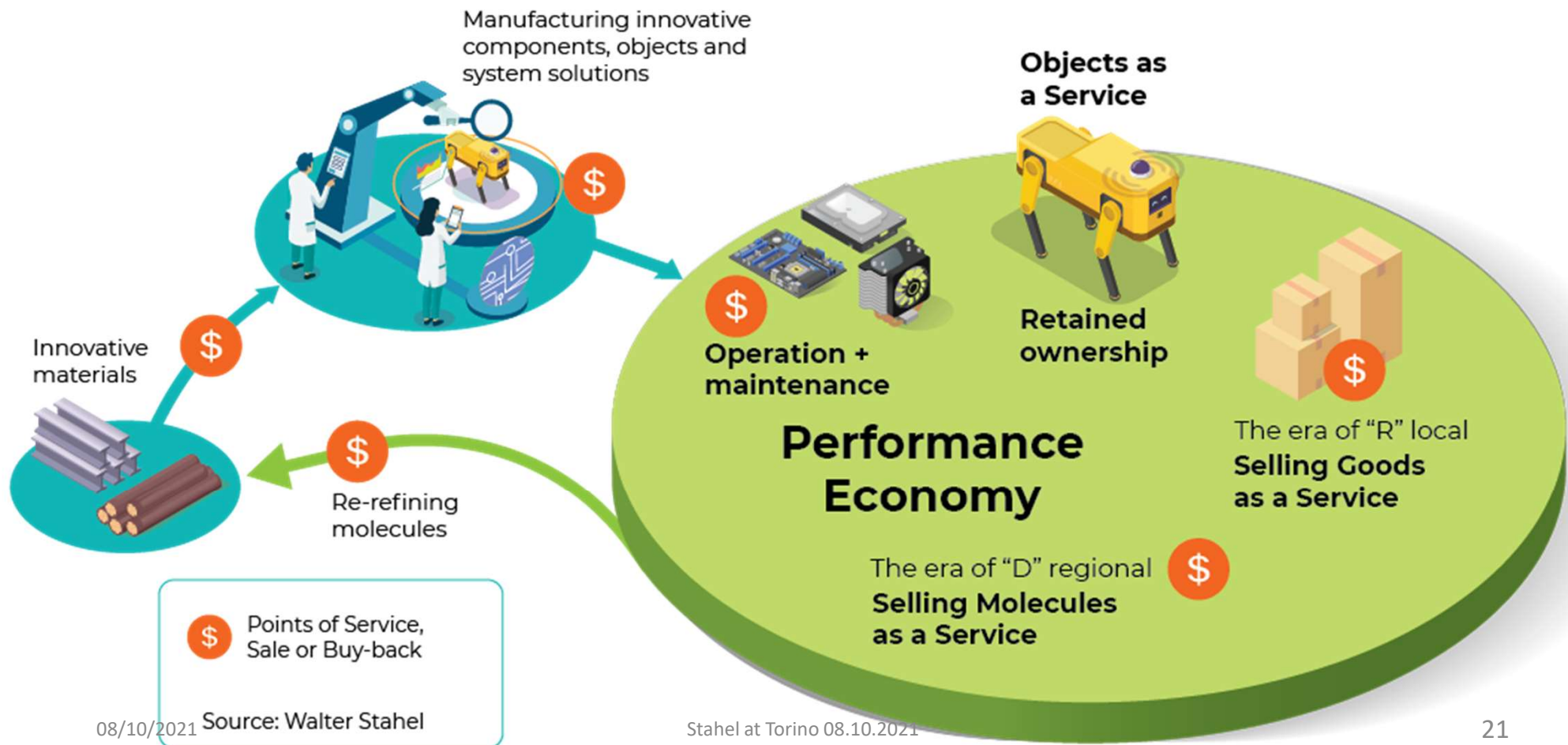
Do not repair what is not broken,

Do not remanufacture something that can be repaired,

Do not recycle a product that can be remanufactured,

Replace or treat only the smallest possible part in order to maintain the existing economic value (*pars pro toto*).

The Performance Economy



Sharing Economy, nature as a paid service



rent a
Christmas tree

Photo: Rent-a-Christmas-tree San Francisco

Objects as a service :

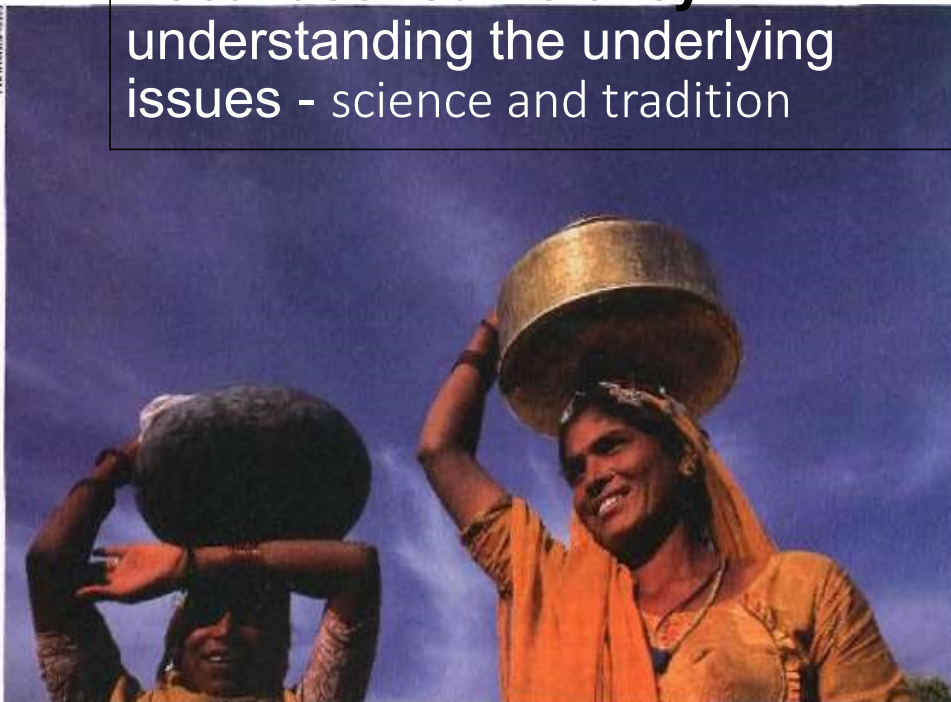
shared use: trains, concert halls, parks,

individual rent, lease: goods, space,

- Inns and Hotels
- ferries, taxis and coaches
- Xerox customer satisfaction
- ISO shipping containers
- public transport
- rental Real estate
- rental vehicles



Local user sufficiency:
understanding the underlying
issues - science and tradition



Brass containers polish off food-poisoning bugs

VILLAGERS in India should not swap the brass "mukha" pots traditionally used to collect and store water for more modern alternatives. True to rumour, water stored in mukhas for a day or two really is safer to drink.

After hearing anecdotal reports that water stored in mukhas is safer, Rob Reed and Pujn Tandon at Northumbria University in Newcastle upon Tyne, UK, decided to investigate. When they added E. coli to water in various

containers, the bacteria were all dead within 48 hours in mukhas, but survived in earthenware or plastic containers. Joint research with Sanjay Chhibber of Panjab University in Chandigarh, using water from contaminated sources in Indian villages, confirmed the finding.

When the researchers analysed the water, they found that the bugs were killed by copper leaching into the water from the brass. "The levels are vanishingly low and safe, a fraction of recommended copper intake," says Reed. Unfortunately, the bacteria die only after one or two days, and most villagers do not leave water in mukhas that long. However, longer storage could now be encouraged.

Sufficiency
through
renounce,
reduce,
reuse,
refill

- waterless urinals,
- plus-energy buildings,
- ploughing by night,
- accessibility instead of mobility.



refill packaging



Only the best for guests

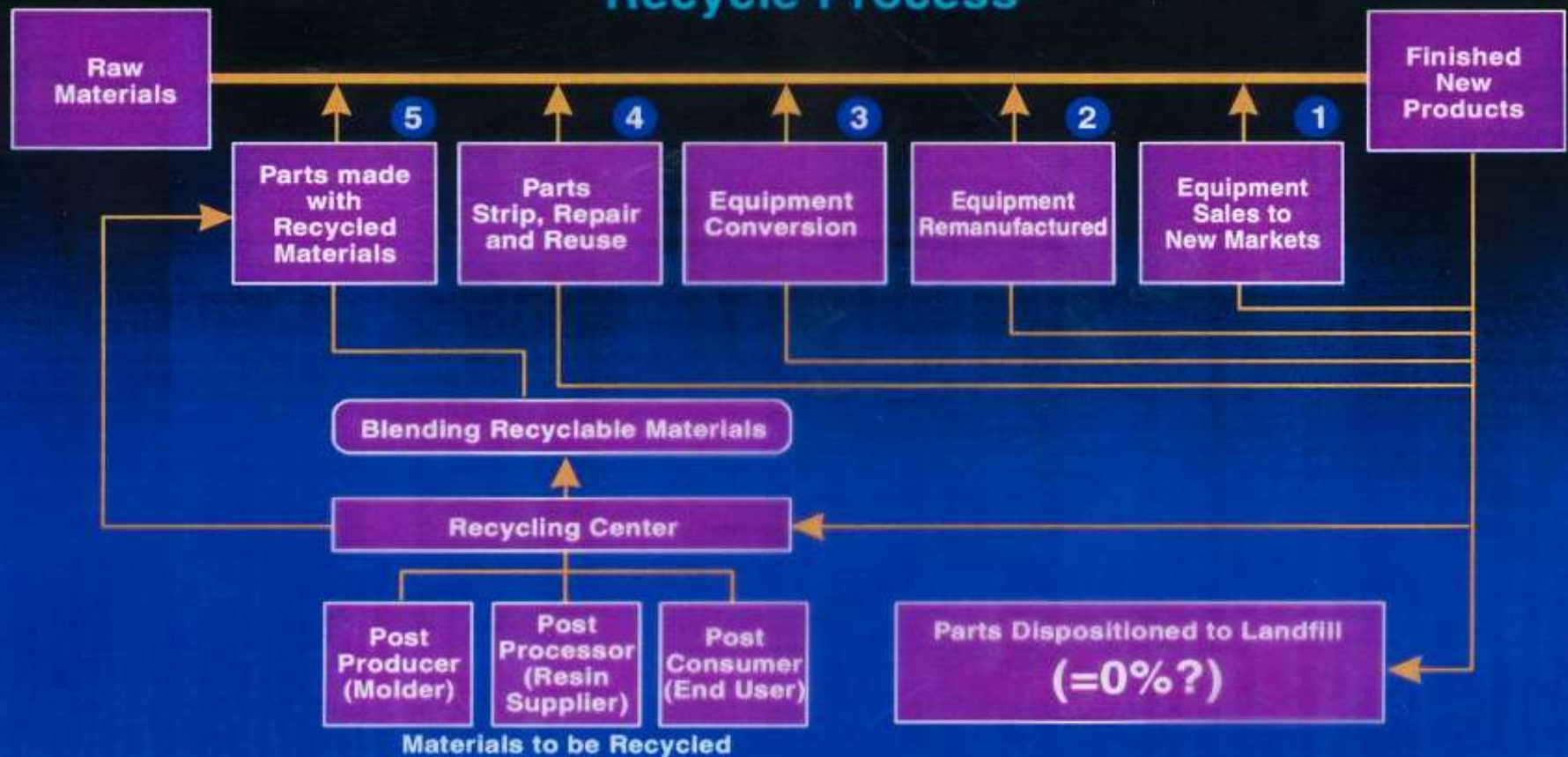
When the Holiday Inn hotel chain wanted premium personal care products for its guest bathrooms that would generate less packaging waste, Diversey/ever came up

Profits in the performance economy: reading from right to left

Xerox Life Cycle Design

1995

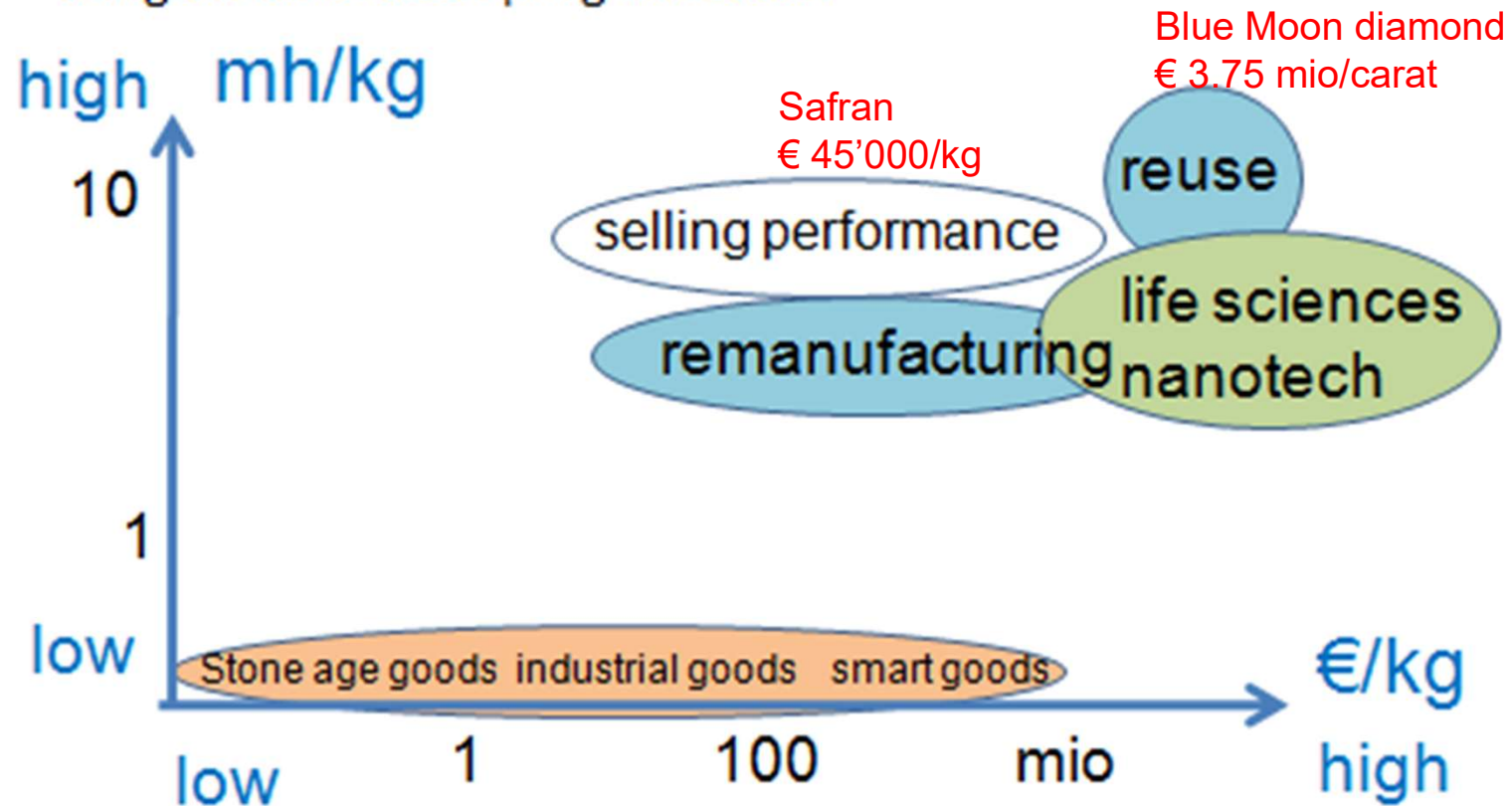
Recycle Process



missing tools to measure sustainability

Performance sustainability rating of sectors

using absolute decoupling indicators



The mh/kg ratio of remanufacturing a car engine is 270 times that of manufacturing a new engine the €/kg ratio 27 times (pars-pro-toto syndrome).

The drivers of the Performance Economy are the owner-fleet managers

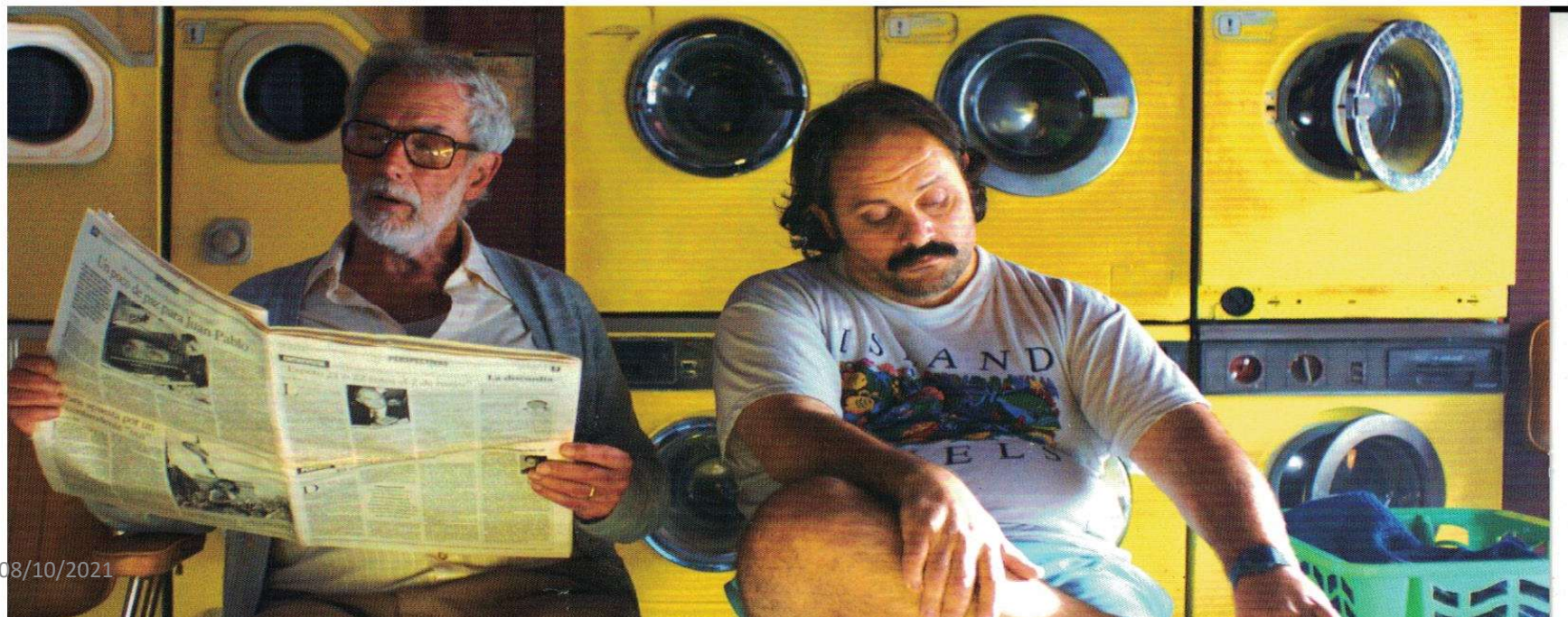
exploiting efficiency, sufficiency and systems solutions, in addition to the opportunities of the Circular Industrial Economy.

Economic actors selling performance

- guarantee results (pharma) or retain the ownership of infrastructure and objects,
- internalise the liability for all costs of risk and of waste,
- save transaction and litigation costs,
- gain long-term resource security (price, quality).

Social systems innovation: **sharing**

To make Laundromats attractive for singles and families, they need to be combined with animation: dancings, internet cafés, kindergarten, playgrounds.



public green performance procurement drives innovation

Space X selling space
transport services



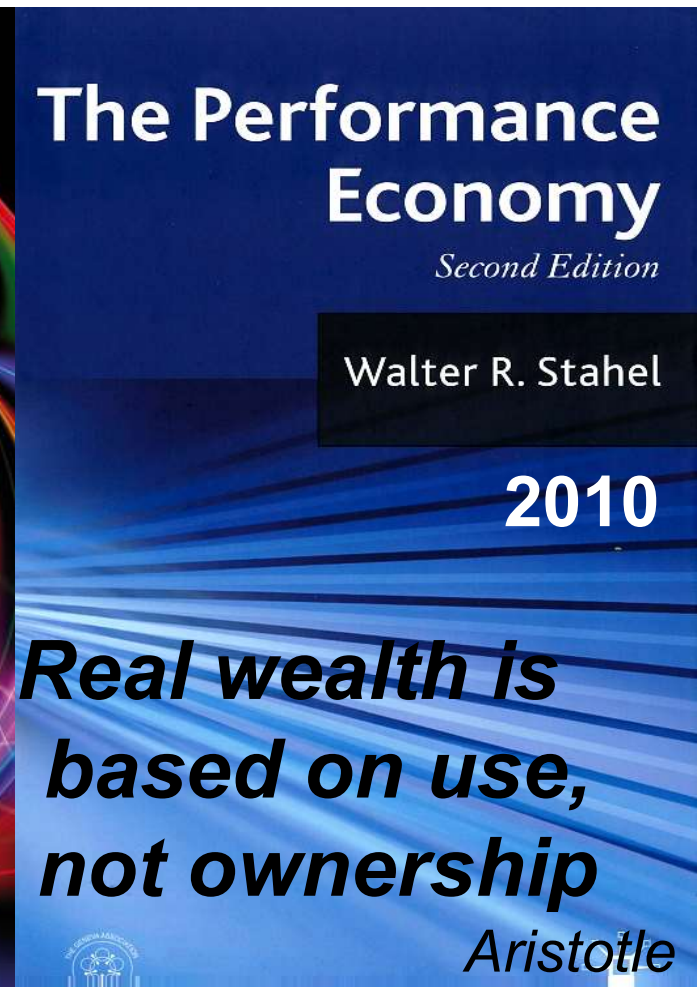
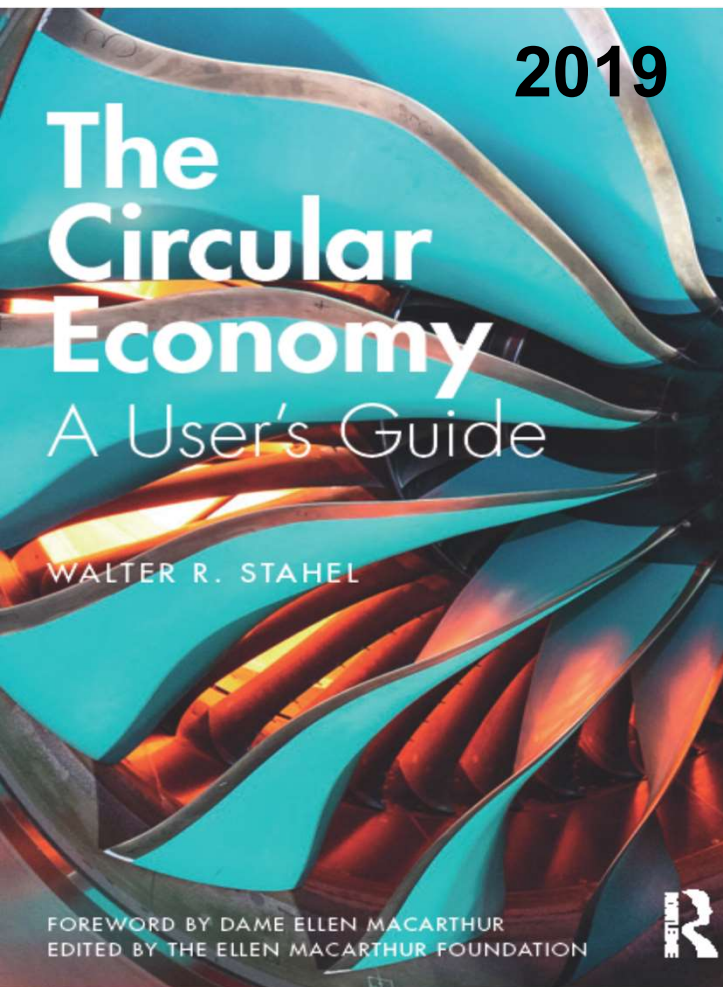
the World's
most powerful
rocket



reusable rocket Falcon

propulsive rocket landing,
*part of a new trend of durable
reusable space technology*





Thank you
for listening !



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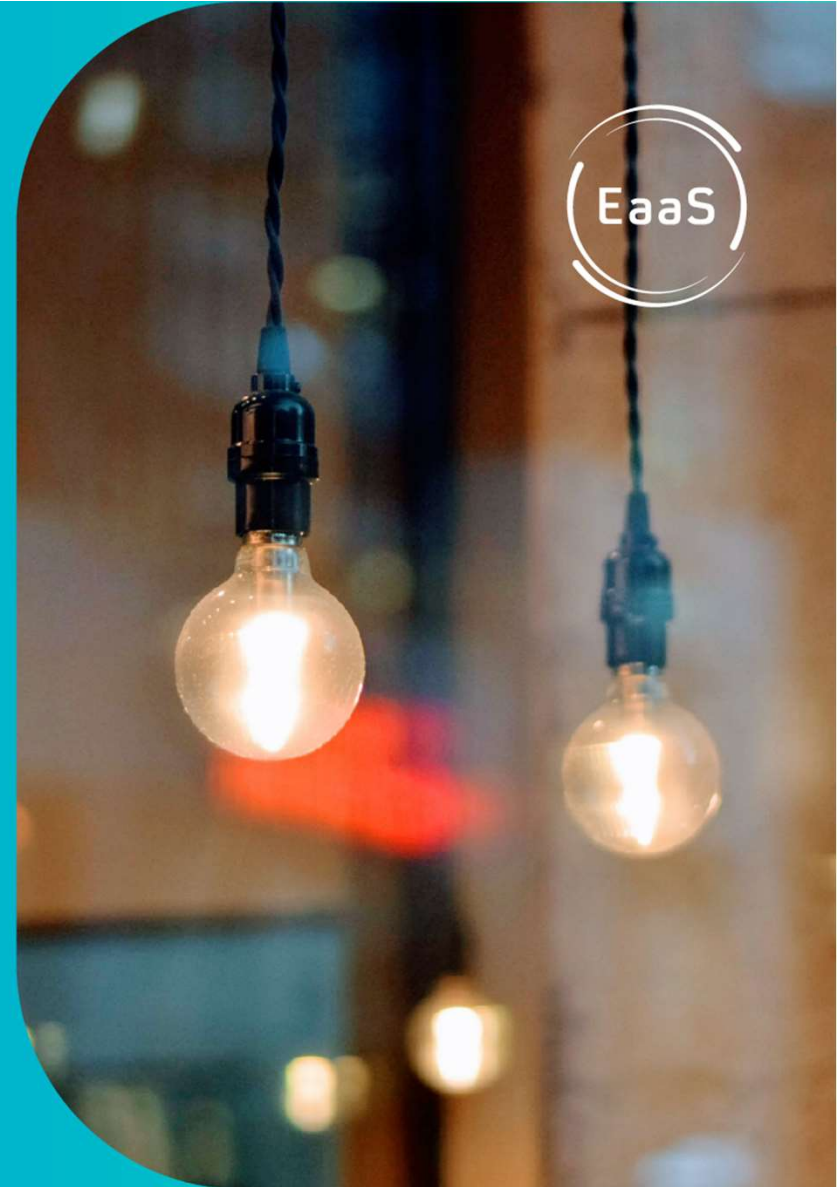
Q&A



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Session 2

Servitisation in practice: AIRPlan





Atlas Copco

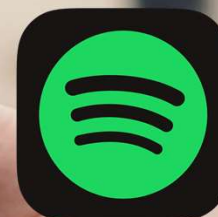
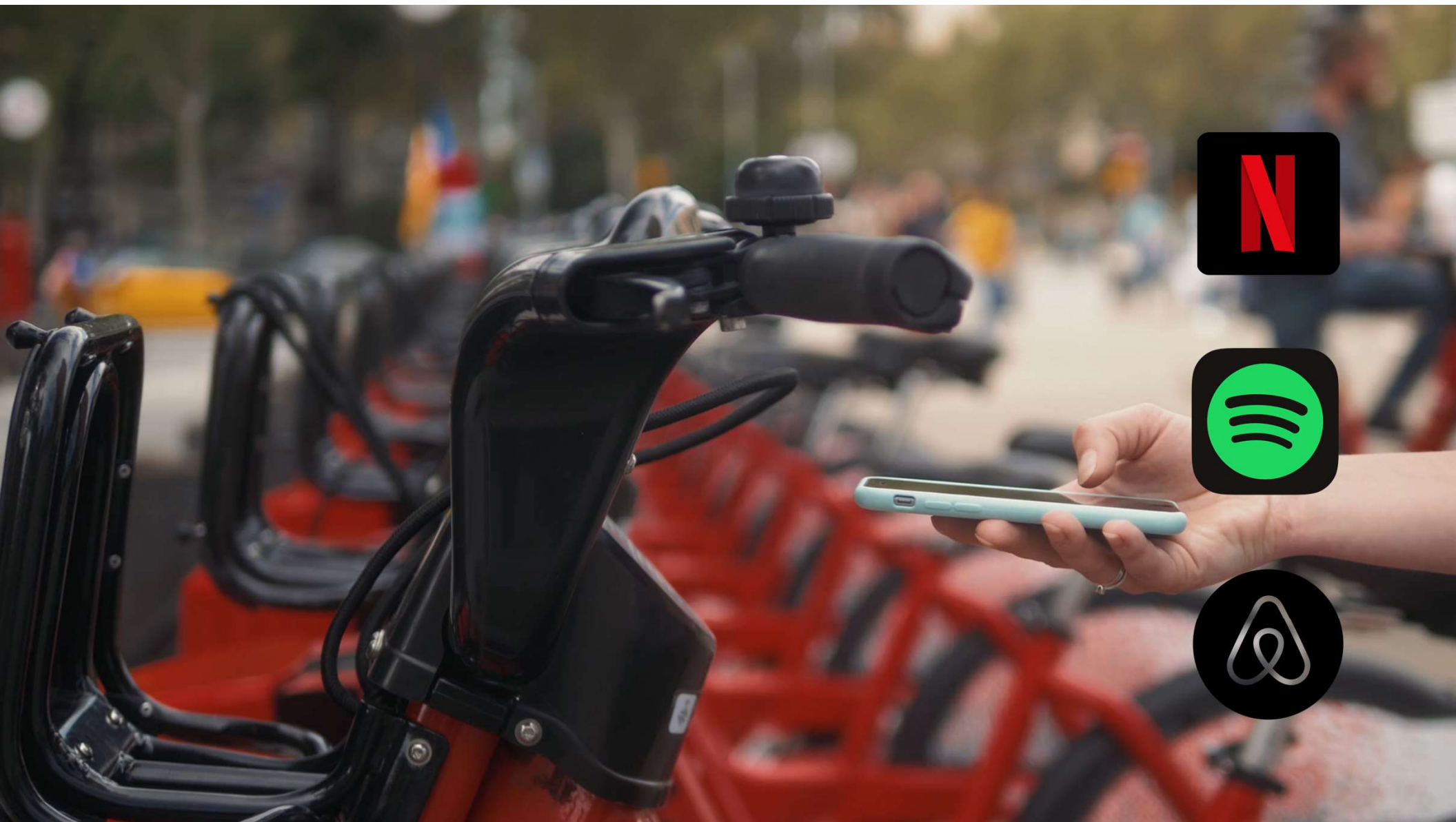


A photograph of a modern industrial facility, likely a factory or warehouse, featuring a complex compressed air system. The system includes large, dark grey Atlas Copco air compressors mounted on the wall and floor, connected by a network of blue and black pipes. A large, vertical, cylindrical air storage tank is visible on the right. The ceiling is high with exposed ductwork and lighting fixtures. The floor is polished and reflects the overhead lights.

AIRPlan

Compressed Air System As A Service

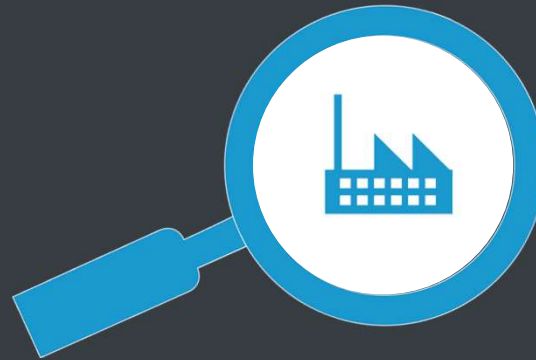
Ilmir Gareev



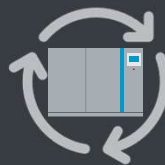
Focus on your core business



INVESTMENTS



EFFICIENCY



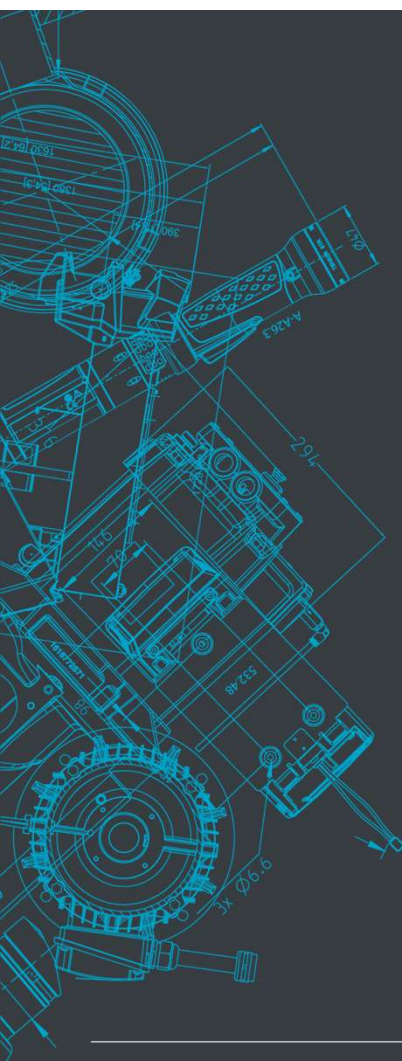
SUSTAINABILITY



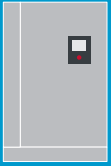
OPERATIONAL
PROCESS



FLUCTUATING
PRODUCTION



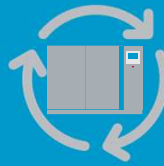
Overcoming boundaries



INVESTMENTS



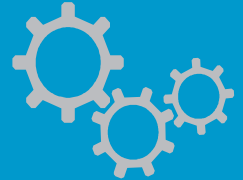
EFFICIENCY



SUSTAINABILITY



FLUCTUATING
PRODUCTION



OPERATIONAL
PROCESS

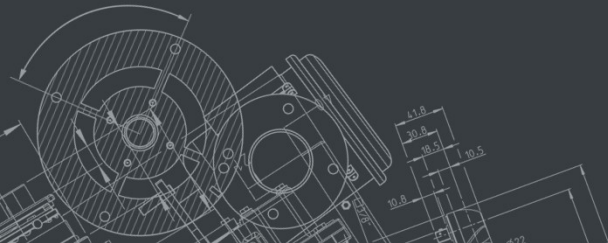
**LOW PERIODICAL
FEE**

**MOST
EFFICIENT
EQUIPMENT**

**ASSET
MANAGEMENT &
UP/DOWNGRADE**

**PAY PER
USAGE**

**MACHINE
AVAILABILITY
GUARANTEE
&
NO EXTRA
COST**





Machines
&
Ancillaries



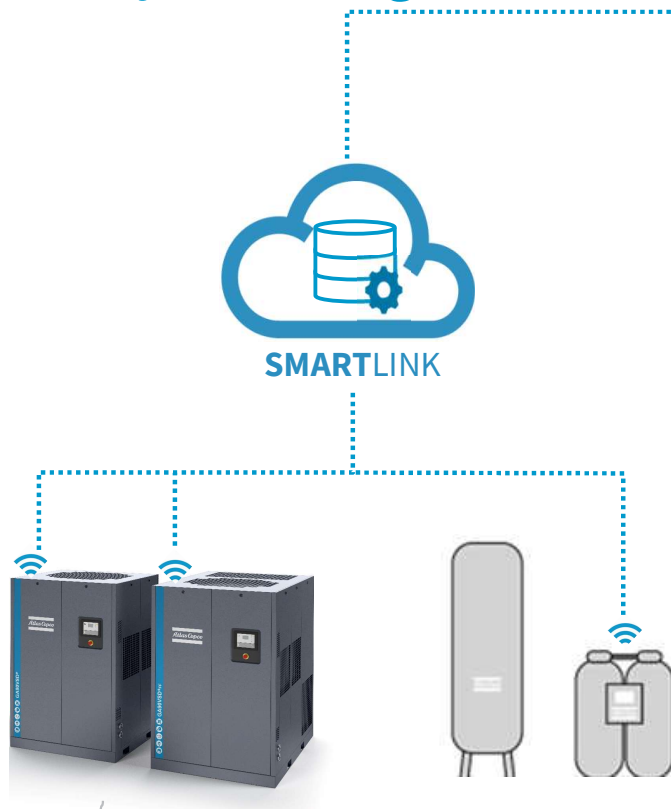
AIRPlan

Pay per use
No initial investment

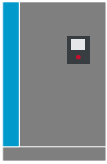
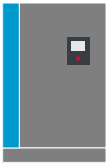
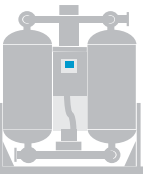
All
inclusive
service



AIRPlan: Pay Per usage



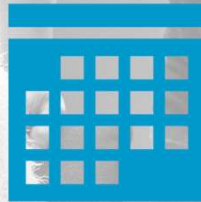
Monthly Fee:

	x running hours	×	X €/hr
+			
	y running hours	×	Y €/hr
+			
	z running hours	×	Z €/hr
+			
	Fixed monthly fee		

AIRPlan: Flexibility



**SIMPLE
CONTRACT**



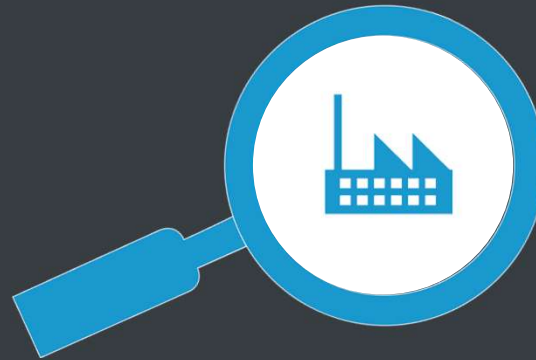
**SHORT
MINIMUM TERMS**



**UP/DOWNGRADE
WITH NO PENALTY**



Focus on your core business



AIRPlan | We handle
Your pressure

Contact me



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Atlas Copco Airpower

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Q&A



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Thank you

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